Monitoring Strategy

Multi-party collaborative input at the geographic area, or larger, scale will generally precede project planning. This collaborative input will assess opportunities for travel management, elk security, and vegetation treatments, as well as other community issues. The input may be used to assist project level analysis. Exceptions may include, but are not limited to, fuels treatments or unplanned events such as insect infestations or wildfires where treatments are relatively inconsequential at the landscape scale.

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
Implementation Monitoring – Are projects being implemented according to Forest Plan direction?							
1.	NFMA; Multiple Goals, Objectives, Strategies	Are projects being implemented according to Revised Plan direction? This includes both planned actions and actual implementation.	High	Select at least one NEPA project, and conduct a thorough review of all resource areas to see if Revised Plan strategies, management prescription desired conditions, standards, and guidelines were followed and if the treatment/project was effective to improve land management.	A/B	Varies according to project scale	Annually

Notes: Priority projects include: prescribed fire, timber harvest, travel management and dispersed recreation, and livestock grazing (these are major revision or implementation topics).

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
2.	Objective 2a, Strategy 8 Objective 4c, Strategy 4	How well is the Forest interacting and planning in cooperation with communities and local governments?	Medium	Narrative summary of grants and agreements; meetings and coordination efforts with local governments and communities. Narrative summary of pre-project collaborative planning. Narrative summary of bi-annual monitoring meetings.	B	State; Big Horn, Johnson, Sheridan and Washakie counties.	Annually
3.	Objective 2b	Are Wild and Scenic River candidate waters being managed for the desired conditions?	Medium	Monitor the outstandingly remarkable values from the suitability/eligibility analysis.	B	Forestwide	Every 5 years
4.	Objective 3a	Is the Bighorn National Forest assisting in building the capacity of Tribal governments, rural communities and private landowners to adapt to economic, environmental, and social change related to natural resources.	High	1. Summary of financial and technical assistance provided to local communities and natural resource based businesses to pursue self-sufficiency and sustainability.	B	Four-county area	Annually
				2. Summary of Bighorn National Forest enhancement of communities' capacities to reduce wildfire risk.	B	Four-county area	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
Effectiveness Monitoring – Are desired conditions and outcomes of the Forest Plan being met?							
5.	Objective 1a Strategy 1	Is water quality on the Forest being maintained according to state water quality standards?	High	1. Coordinate with Wyoming Department of Environmental Quality and other stakeholders, to develop a water quality monitoring plan for streams identified in the 305(b) Report and 303(d) List of Impaired Streams.	A	Forestwide	Annually
			Low	2. Identify potential sites for long-term water quality monitoring. Monitoring items might include, but are not limited to, temperature, dissolved oxygen, pH, microorganism or benthic macroinvertebrates for refinement of regional databases.	A	Forestwide	Every 5 years
6.	Objective 1a Strategy 2	Were watershed improvement projects completed?	High	Summarize number and type of watershed improvement projects. Identify what percentage of the watershed or length of stream reach has been treated.	A/B	Geographic Area	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
7.	Objective 1a Strategy 3	Was the revegetation guidebook completed?	Low	Report accomplishment date.	A	Forestwide	Every 5 years
8.	Objective 1a Strategies 4 – 7	Are aquatic habitat conditions being maintained for native plant, invertebrate and vertebrate riparian-dependent species?	High	1. Summarize results of long-term, reach-level monitoring sites, including riparian vegetation.	A/B	Ecological subsection, Forestwide	Every 5 years
			High	2. Summarize results of habitat improvement projects (acres/miles) by watershed.	A/B	Forestwide	Annually
9.	NFMA Species Viability Objective 1b Strategies 1 – 5	Is the Bighorn National Forest providing the ecological conditions to sustain viable populations of native and desired non-native species and to achieve objectives for Management Indicator Species (MIS)?	High	1. Number of Conservation Strategies developed or implemented.	A	Forestwide	Annually
			High	2. Acres of species at risk habitat restored or improved by Forest Service management or permitted activities.	B	Forestwide	Annually
			High	3. Acres of species at risk potential habitat inventoried.	A/B	Forestwide	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
9.	NFMA Species Viability Objective 1b Strategies 1 – 5, cont.		High	4. Acres of species at risk occupied habitat and/or populations discovered.	A/B	Forestwide	Annually
			High	5. Acres of vegetation management projects and natural disturbances that occurred in lynx habitat and winter snowshoe hare habitat during the previous fiscal year. Update vegetation GIS coverage to include these acres and compare with suitable habitat thresholds.	A	Forestwide	Annually
			High	6. Number of species or habitat monitoring programs established/implemented, including cave resource management and Research Natural Area (RNA) management plans.	A/B	Forestwide	Annually
			High	7. Summarize species-specific monitoring results.	A/B	Forestwide	Specific to monitoring protocol

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
9.	NFMA Species Viability Objective 1b Strategies 1 – 5, cont.		High	8. Number of acres of demand species habitat improvement, including big game winter range.	A/B	Forestwide	Annually
10.	NFMA Species Viability Objective 1b, Strategies 5-11	Are the habitat trends (and therefore population trends by inference) for MIS and other emphasis species being maintained or improved with respect to management activities conducted?	High	1. Acres and condition of habitat on the Forest for each avian and the red squirrel MIS. Associate habitat trend with available population data where feasible. Participate in the interagency statewide avian population monitoring effort (Monitoring Wyoming's Birds).	A	Forestwide	Annually
			High	2. Results of beaver (MIS) colony reintroduction and aerial survey of number of occupied 6th-level Hydrologic Unit Code (HUC) watersheds. Tie to habitat condition and trend monitoring provided through aquatic and range resource monitoring.	A	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
10.	NFMA Species Viability Objective 1b, Strategies 5-11, cont.		High	3. Acres of elk (MIS) security areas, and association with past amounts available, elk distribution patterns, harvest success, hunt area strategies, herd composition, and population objectives. Updates to road density and vegetation GIS layers to rerun security habitat model.	A/B	Forestwide	Every 5 years
			High	4. Continued habitat use by bats at known occupied caves. Cave roost surveys and other methods.	A/B	Forestwide	Every 5 years
			High	5. Continued habitat use by goshawks in known nesting territories where active vegetation management has occurred. Verification through nest search with broadcast calls.	A/B	Forestwide	Annually
.			High	6. Continued habitat use by water voles in known locations using live trap or other methods.	A/B	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
10.	NFMA Species Viability Objective 1b, Strategies 5-11, cont.		High	7. Continued habitat use by forest carnivores in known locations using snow-track or other methods. Determine validity of any reported lynx sightings upon report.	A/B	Forestwide	Every 2 years
			High	8. Continued habitat use by amphibians in known locations. Number of reintroductions or expansions of range in stream reaches.	A/B	Forestwide	Every 5 years
			High	9. Rainbow trout (MIS) and Yellowstone cutthroat trout (sensitive species) habitat condition and trend. Report expansions of Yellowstone cutthroat trout populations by stream name and length.	A/B	Forestwide	Every 3 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
10.	NFMA Species Viability Objective 1b, Strategies 5-11, cont.		High	10. Continued habitat use by raptor and other rare avian species where known nest locations occur. Nest searches and expanded inventories.	A/B	Forestwide	Every 10 years
Notes: Many items above depend on coordination with Wyoming Game and Fish Department, and reliance on their population/harvest data for big game and fish species. Surveys for Forestwide distribution for several at-risk species (water vole, bats, avian, amphibians, carnivores, raptors) have not been completed and would be the goal in next planning period.							
11.	Objective 1c Strategies 1 – 7	Is the Bighorn National Forest increasing the amount of vegetative communities restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases and invasive species?	High	Compare the acres estimated to be treated in the Revised Plan with the actual number of acres treated. Track the results of natural disturbances. Add to actual number of acres treated. Update the GIS vegetation database with all vegetation changes. See note below for treatments estimated for this plan period.	A	Geographic Area	Every 5 years
			High	Review vegetation treatments to see if they mimic the scale and effect of natural processes.	B	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
11.	Objective 1c Strategies 1 – 7, cont.		High	Acres/sites of invasive weed infestations compared to previous inventories. Number of acres treated by treatment type and target species. Description of preventive activities. Coordinate, as appropriate, with the counties. Evaluate sources or activities contributing to infestations.	B	Forestwide	Every 5 years
			High	Summarize acres of aspen treated. Summarize efforts and results of inventory/monitoring for condition of stands.	B	Forestwide	Every 5 years
			High	Identify location and amount of old growth and compare to desired amounts. Update vegetation coverage in GIS.	A/B	Geographic area	Every 10 years
			High	Summary of control measures for insect/disease outbreaks in high value areas (acres treated).	A/B	Forestwide	Every 3 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
11.	Objective 1c Strategies 1 – 7, cont.		High	Summarize insect/disease treatments, and compare to aerial inventory of insect/disease occurrences and extent to determine effectiveness.	A/B	Forestwide	Every 3 years
			High	Summary of wildland fire interagency relationships maintained, fostered or improved. Summary of firefighter and public safety based on these actions.	B	Forestwide	Every 3 years
			High	Acres of fuel reduction accomplished in Fire Regimes I, II, and III.	A	Forestwide	Annually
			High	Number of wildland fire use plans completed. Number of acres treated.	A	Forestwide	Annually

Notes: The following vegetation treatments will be monitored.

A. Clearcut
B. Shelterwood – prep cut
C. Shelterwood – seed cut
D. Shelterwood – overstory removal
E. Aspen regeneration/maintenance
F. Precommercial timber stand improvement
G. Uneven-aged management, selection
H. Prescribed fire
I. Wildland fire use/wildfire*
J. Insect and disease mortality*
K. Blowdown*
L. Commercial intermediate harvests
M. Reforestation

* These are not planned actions but will be tracked through GIS vegetation database.

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
12.	Objective 1.c, Invasive Species Strategy 2	How many total acres of all noxious weeds are known to occur on the Forest?	High	Acres of noxious weeds	A	Forestwide by District	Every 5 years
		How many acres of priority noxious weeds are known to occur on the Forest?	High	Acres of priority noxious weeds	A	Forestwide by District	Every 5 years
		How many acres of priority noxious weeds have been treated this year by what means?					
		Manual	High	Acres of priority noxious weeds treated	A	Forestwide by District	Annually
		Mechanical	High	Acres of priority noxious weeds treated	A	Forestwide by District	Annually
		Cultural	High	Acres of priority noxious weeds treated	A	Forestwide by District	Annually
		Biological	High	Acres of priority noxious weeds treated	A	Forestwide by District	Annually
		Chemical	High	Acres of priority noxious weeds treated	A	Forestwide by District	Annually
		How many total acres of noxious weeds have been treated this year?	High	Acres of noxious weeds	A	Forestwide by District	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
12.	Objective 1.c, Invasive Species Strategy 2, cont.	What prevention activities and cooperative efforts have been implemented during the past year?	High	Narrative description	B	Forestwide by District	Annually
13.	Objective 1a Strategy 2	Is usage of dispersed campsites negatively impacting watershed conditions?	Medium	Campsite impacts measured and reported using campsite inventory process.	A/B	Cloud Peak Wilderness 6th-level HUC watersheds	Every 5 years
Notes: Campsite condition and numbers can help to determine a trend of potential physical or biological resource damage. Continued growth of unplanned dispersed recreation is a concern.							
14.	Objective 2a Strategy 2	Are developed recreation sites/facilities providing diverse, high quality outdoor recreation opportunities?	Medium	1. Number of master plans written for developed sites.	A/B	Forestwide	Every 5 years
15.	Objective 2a, Strategies 2, 5, 8 - 12 Objective 2c, Tourism and Recreation Strategies 1-3 Objective 4a, Strategy 2	Does the demand for recreation warrant development of additional opportunities (e.g. trails, dispersed campsites, etc.)?	Medium	Narrative description using customer surveys, public contacts, field observations, visitation use records and projections and comparison to available capacity.	A/B	Forestwide	Every 5 years
16.	Objective 2a Strategy 3	To what extent were vegetation management plans written for developed recreation sites?	Low	Number of vegetation management plans for developed sites and condition of the resource in developed sites.	A/B	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
17.	Objective 2a, Strategies 5, 6, 9, 10, and 12 Objective 4a, Strategy 1	Is an adequate range of travel opportunities being offered across the Forest?	Medium	1. Individual and organized recreation club contacts, location, trend, and nature of use conflicts, Incident Reports.	B	Forestwide	Every 3 years
			Medium	2. Number of travel management plans completed.	A/B	Forestwide	Annually
			Medium	3. Scenic byway day use trail completed.	A	Forestwide	Every 5 years
Notes: Studying use and projected demand should assist in future project planning to provide multiple benefits to multiple people. Vegetation within developed facilities (e.g., campgrounds) contributes substantially to the recreation setting. Attaining desired conditions and monitoring results will protect these values over the life of the facility.							
18.	Objective 2b, Wilderness Strategies 2 – 5	Are human uses of wilderness allowing for preservation of wilderness resources?	High	Report soil and vegetation disturbed by human use based on a sample of use areas.	A/B	Wilderness	Every 5 years
		Is the quantity of dead and down woody debris adequate to maintain natural soil characteristics and functions?	High	Evaluate tons per acre of dead and down woody material. (Brown - Handbook for Inventorying Downed Woody Material)	A	Wilderness	Every 5 years
		What level of crowding occurs on trails? Does the wilderness provide opportunities for solitude?	High	Report number and type of users by trailhead, law enforcement contacts, and educational presentations.	B	Wilderness	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
18.	Objective 2b, Wilderness Strategies 2 – 5, cont.	Are special exceptions affecting the wilderness resource?	Medium	Report the number and type of special exceptions to limited activities	A		Annually
Notes: Monitoring may indicate if a limited permit system or other restrictions are necessary.							
19.	Objective 2b Wilderness Strategy 1	Is air and water quality being improved, maintained or degraded in the Cloud Peak Wilderness, and on the Forest as a whole?	High	Coordinate collection and analysis of IMPROVE[1] data (or subsequent protocols) on air quality.	A/B	Established monitoring sites Forestwide	Annually
			High	Collect and analyze alpine lake water samples for information on air and water quality. Apply quality assurance protocol.	A/B	Established monitoring sites Forestwide	Annually
			High	Review state air quality data for incidences of impairment in relation to Forest activities.	A/B	Established monitoring sites Forestwide	Annually
			High	Prepare summary of annual compliance and identify needed improvements.	A/B	Established monitoring sites Forestwide	Annually
20.	This Monitoring Driver was a duplicate of #18. The number has been retained to avoid renumbering all subsequent monitoring drivers.						

[1] Interagency Monitoring of Protected Visual Environments

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
21.	Objective 2b Heritage Strategy 1	Have programmatic agreements for heritage resources been negotiated and implemented for Forest programs?	High	Number and types of agreements in place.	A/B	Forestwide	Every 2 Years
				Identify other program needs and reduce backlog.	A/B	Forestwide	Every 2 Years
				Summarize if terms of agreements are being met.	A/B	Forestwide	Annually
22.	Objective 2b Heritage Strategy 2	Is the Bighorn National Forest preparing and implementing Historic Preservation Plans?	High	Number of plans completed and implemented.	A/B	Forestwide	Annually
23.	Objective 2b Heritage Strategy 3	What progress has the Forest made for inventorying areas having a high probability for heritage resources?	High	Acres inventoried.	A	Forestwide	Annually
			High	Number of new sites evaluated.	A	Forestwide	Annually
			High	Number of backlogged unevaluated sites that have been evaluated.	A	Forestwide	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
23.	Objective 2b, cont. Heritage Strategy 3		High	Number of sites evaluated sent to the State National Register of Historic Places.	A	Forestwide	Annually
Notes: Related to Section 110 of the National Historic Preservation Act.							
24.	Objective 2b Heritage Strategy 4	Is the Forest meeting its consultation responsibilities for American Indian traditional cultural properties?	High	Number of sites identified.	A/B	Forestwide	Annually
			High	Number of sites consulted on.	A/B	Forestwide	Annually
Notes: Includes responsibilities under Sections 110 and 106 of the National Historic Preservation Act.							
25.	Objective 2b, Heritage Strategy 5 Objective 2c, Tourism and Recreation Strategy 2	What actions has the Forest taken to increase public awareness and education of heritage resources?	Medium	Number of "Pit" projects conducted.	A	Forestwide	Annually
			Medium	Number of heritage programs delivered.	A	Forestwide	Annually
			Medium	Number of interpretive signs or brochures constructed or maintained.	A	Forestwide	Annually
26.	Objective 2c Livestock Grazing Strategies 1 and 2	What total AUMs were permitted through term permit this grazing season?	High	AUMs Permitted	A	Forestwide by District	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
26.	Objective 2c, cont. Livestock Grazing Strategies 1 and 2	What total AUMs were authorized through term permit this grazing season?	High	AUMs Authorized	A	Forestwide by District	Every 5 years
		What total acres of suitable rangeland are in active allotments?	High	Acres in allotments	A	Forestwide by District	Every 5 years
		How many pastures were monitored this year to determine whether allowable use standards were met?	High	Pastures monitored	A	Forestwide by District	Annually
		How many pastures that were monitored did meet allowable use standards?	High	Pastures meeting allowable use standards	B	Forestwide by District	Annually
		In pastures that were monitored, how many key areas were inspected for compliance with allowable use standards using the various protocols?	Medium	Number of key areas monitored by specific protocol	A	Forestwide by District	Annually
		What percent met standards?	Medium	Percent that met standards	B	Forestwide by District	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
26.	Objective 2c Livestock Grazing Strategies 1 and 2, cont.	How many allotments exceeded forage utilization standards to the point of discussing/implementing actions to resolve the situation?	High	Number of allotments	A	Forestwide by District	Annually
		How many suitable acres are meeting or moving toward desired conditions?	High	Acres meeting/moving toward desired condition	B	Forestwide by District	Every 5 years
			High	Acres not meeting or moving toward desired conditions	B	Forestwide by District	Every 5 years
			High	Acres undetermined	B	Forestwide by District	Every 5 years
		How many suitable riparian acres are meeting or moving toward desired conditions?	High	Acres meeting/moving toward desired condition	B	Forestwide by District	Every 5 years
			High	Acres not meeting or moving toward desired conditions	B	Forestwide by District	Every 5 years
			High	Acres undetermined	B	Forestwide by District	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
26.	Objective 2c Livestock Grazing Strategies 1 and 2, cont.	How was information sharing and cooperation with livestock permittees, state and private agriculture organizations, universities, and research partners demonstrated?	High	Narrative discussion	B	Forestwide by District	Annually
		How many allotments are administered by this unit?	High	Number of allotments	A	Forestwide by District	Every 5 years
		How many allotments are NEPA sufficient?	High	Number of allotments NEPA sufficient	A	Forestwide by District	Every 5 years
		How many allotments were covered by new NEPA decisions this fiscal year?	High	Number of allotment decisions this year	B	Forestwide by District	Annually
		Are existing levels of combined wildlife and livestock herbivory in key areas acceptable?	Medium	Sites monitored/sites where use was unacceptable	B	Forestwide by District	Every 5 years
			Medium	Narrative discussion.	B	Forestwide by District	Every 5 years
27.	Objective 2c Stewardship Strategy 1	Is the Bighorn National; Forest utilizing stewardship contracting appropriately? Is stewardship contracting a benefit to local communities?	Medium	Narrative summary of stewardship contracts utilized compared to the opportunities and other tools used. Estimate benefits to communities.	B	Regionwide and 4-County Bighorn National Forest area	Annually

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
28A.	Objective 2c Geologic and Paleontological Resources Strategy 1	Have impacts to paleontological resources resulted in a need to revise/amend the plan for additional direction?	Low	New paleontological sites identified during cultural or other inventoires and associated impacts from land management activities.	B	Forestwide	Annually
28B.	Objective 2c Mineral and Energy Resources Strategy 1	Are the effects of mining activities on surface resources consistent with Revised Plan expectations, as allowed in approved Plans of Operations?	Medium	Summarize monitoring efforts, results, and findings under project-specific Plan of Operations.	A	Forestwide by representative project	Annually
29.	Objective 2c Timber Strategies 1, 2, 3	Is the Bighorn National Forest providing the desired level of uses, values, products and services of wood products?	High	Forest product outputs in CCF and approximate MMBF, including: Sawtimber (7" +), Roundwood (5-6.9"), Personal Use Fuelwood, Other Vegetation Management, Allowable sale quantity, Christmas Trees and Special Forest Products	A	Forestwide	Annually

Notes: The Revised Plan projected the following outputs annually:
Sawtimber (7" +): 10,688 CCF, *(3.9 MMBF)*
Roundwood (5-6.9"): 1,693 CCF, *(0.6 MMBF)*
Personal Use Fuelwood: 3,000 CCF, *(1.5 MMBF)*
Other Vegetation Management: 3,550, *(1.3 MMBF)*
Allowable Sale Quantity: 27,183 CCF, *(9.8 MMBF)*
Christmas Trees (number sold): 2,100 trees
Special Forest Products: 3,000 permits

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
30.	Objective 2c Scenery Strategy 1	Are Scenic Byway landscpes being manged to maintain scenic quality through time?	Medium	Report accomplishments in planning, prioritizing and implementing activities in vegetation and facilitiy management.	A/B	Scenic Byway Corridors	Every 5 years
31.	Objective 2c Scenery Strategy 2	Are resource activities and forest uses consistent with the landscape character goals and scenic integrity objectives?	Medium	Review a sample of management activities, and compare forest plan direction with actual outcomes.	A/B	Geographic Areas	Annually
31.	Objective 2c Scenery Strategy 2, cont.		Medium	Map and measure total acres and % of geographic area at each scenic integrity level.	A/B	Geographic Areas	Every 5 years
			Medium	Map areas needing restoration and areas restored.	A/B	Geographic Areas	Every 5 years
			Medium	Compose a narrative and photographic description of the area's landscape character and character changes.	A/B	Geographic Areas	Every 5 years
32.	Objective 3b Strategy 1	What is the current condition of the 2005 inventoried roadless areas?	High	Map areas within the 2005 roadless areas that no longer maintain roadless character. Identify the types of uses and development incompatible with roadless character	B	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
33.	Objective 4a, Strategies 3 – 5	Are all system roads being maintained as desired on the Bighorn National Forest?	High	Percent of roads maintained to standard via force account crew, contract, cooperators, or other means (See annual Roads Accomplishment Report).	A	Forestwide	Annually
34.	Objective 4a Strategy 6	Are unclassified roads and trails being decommissioned?	Medium	Report road decommissioning accomplishments and trail decommissioning accomplishments performed via force account, contract, cooperators, or other means (See annual Roads Accomplishment Report).	A	Forestwide	Annually
35.	Objective 4a Strategies 7, 8	Are new construction and maintenance projects being done to reduce maintenance backlogs and are they being done consistent with the current master plan, and meeting the current image guide?	Medium	Report all new facility and transportation construction, reconstruction, decommissioning, and maintenance projects and state how they are reducing maintenance backlogs, or how they are meeting the current FMP[2] or the BEIG.[3]	A	Forestwide	Annually

[2] Facilities Master Plan

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
36.	Objective 4a Strategies 1, 2	What is the current open road and motorized trail density as an indicator of maintenance backlog, recreation opportunity, and wildlife habitat needs?	Medium	Summarize open road and motorized trail density by 5th-level HUC watershed or results in Roads Analysis Process.	A	Forestwide	Every 5 years
			Medium	Update GIS coverages when actions implemented.	A	Forestwide	Every 5 years
37.	Objective 4a Strategy 11	How many miles of system or non-system road were decommissioned?	Medium	Review annual engineering work accomplishment reporting	A	Forestwide	Annually
38.	Objective 4b Strategy 1	To what extent are forest access needs being met?	Medium	Monitor concerns from local counties and forest users.	B	Forestwide	Every 5 years
			Medium	Number and status of right-of-way acquisitions	B	Forestwide	Every 5 years
Notes: Providing access to public lands is critical for meeting resource management and multiple-use objectives.							
39.	Objective 2c, Tourism and Recreation Strategy 1 Objective 3b, Strategy 3	Are research, education, and interpretation activities being conducted and in conjunction with partners?	Low	Number of educational presentations, research projects, agreements, or activities conducted with and for others. Identify by resource function.	B	Forestwide	Annually

[3] Built Environment Image Guide

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
Validation Monitoring- Are the desired conditions, objectives, and assumptions made in the Forest Plan correct?							
40.	Objective 1a, Strategy 1	Are Best Management Practices (BMPs) effective in meeting water quality standards?	High	Conduct long-term best management practice effectiveness studies according to study plans for specific BMPs coordinated across the forest.	A/B	Forestwide by representative project	Annually
Notes: Examples include: stability and effectiveness of stream buffers, road drainage structure operations and maintenance, soil disturbance and downstream aquatic habitat effects in harvested versus non-harvested areas, effectiveness of stream protection to minimize sediment delivery to fish streams. Annual status reports to be completed.							
41.	Objective 1b Strategy 2	Have management strategies (goals, objectives, standards, guidelines) resulted in an improved status for species at-risk and MIS?	High	Revisit known location, habitat and population trend information data in conjunction with heritage databases or other sources.	A/B	Forestwide	Every 10 years
			High	Compare existing status to previous status by species.	A/B	Forestwide	Every 10 years
			High	Validate appropriateness of MIS selected, and the management direction associated with them (e.g., elk security).	A/B	Forestwide	Every 10 years
Notes: Tie known information to regional species assessments as applicable. Amend or edit plan to reflect species at risk or other emphasis species categorizations to ensure correct habitats/species are being monitored. Verify if resource outputs are in concert with habitat desired conditions, standards, and guidelines. Alter or amend plan direction as needed. Determine if there were significant changes in elk security habitat, and if these resulted in improved hunting opportunities. Determine if improvements were made in presence/absence or distribution for species for which little information is known.							

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
42.	Objective 1a	Are the standards and guidelines effective in meeting regional soil quality standards?	Medium	Conduct surveys on a representative sample of areas with management activities and uses.	A	Forestwide by representative project	Annually
			Medium	Measure the amount of severely impacted areas and compare with regional standards.	A	Forestwide by representative project	Annually
43.	Objective 1a, Strategy 4	Are fisheries and riparian standards and guidelines effective in maintaining or improving fish habitat or do they need revised?	High	Survey a representative sample of fish bearing streams in or adjacent to management activities (e.g., transportation networks and associated stream crossings, range allotments, timber sales, or recreational sites) occurring within the last year.	A	Forestwide by representative project	Annually and every 5 years
Notes: Habitat components important for fish include large woody debris, pool depth, frequency, percent pool area, and stream width-depth ratio.							
44.	Objective 1c Strategy 4	Were the actions taken to minimize insect/disease epidemics effective?	Medium	From summary of treatments, compare to aerial inventory of insect/disease occurrences and the extent of them to determine effectiveness.	A/B	Forestwide	Every 5 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
45.	Objective 3b, Strategies 1 – 3	Is the Bighorn National Forest improving the knowledge base provided through research, inventory, and monitoring to enhance scientific understanding of ecosystems, including human uses, to support decision-making and sustainable management of the Bighorn National Forest?	Medium	Utilize Forestwide inventory and analysis plots (Forest Inventory and Aanlysis), and FSVeg data from projects, Forest Health Management plots, to validate stand condition standards and guidelines, such as snags, coarse woody debris, old growth, habitat descriptions, fuel conditions.	B	Forestwide	Every 10 years
46.	Objective 2c Livestock Grazing Strategies 1, 2	Are livestock grazing standards and guidelines effective in meeting or moving toward desired conditions in riparian and upland rangeland vegetation sites?	Medium	From reference stream reaches and upland sites, determine potential and progression towards potential or desired conditions. Methods may include greenline and cross-section protocols for riparian sites and cover frequency for upland sites.	A/B	Forestwide	Every 10 years

	Monitoring Driver	Monitoring Question	Monitoring Priority	Potential Monitoring Items	Precision & Reliability	Scale	Frequency of Reporting
47.	Forestwide Biodiversity Guideline 10 Forestwide Scenery Guideline 2	What is the relationship between guidelines for downed logs/coarse woody debris and the scenic integrity scale?	Low	For a range of Bighorn vegetation management sites, determine "tons per acre" and other metrics of woody debris. Describe visual characteristics and other descriptive qualities of the sites. Based on field data identify relationships and determine most useful woody debris descriptors for varied resource values.	A/B	Forestwide	Planning Period
48.	CFR 219.14 Objective 2c, Timber Strategy 2	Is the Bighorn National Forest inventory of lands suitable for timber production (suited lands) accurate?	High	Utilize the three-step process outlined in law and direction to evaluate the suitability of lands for timber production. Review the Bighorn National Forest suitability key to determine its validity in implementation.	A	Forestwide	Every 10 years